As a Principal Investigator for 6 separate National Science Foundation Wireless Projects between 1995 and 2003, in which the NSF awarded my company – Old Colorado City Communications – over $2 million in grants, I am fully qualified to comment on the deficiencies of radios operating under current unlicensed rules to support field science and scientists in remote and rural areas of the US, wirelessly.

If for no other reason that the ability of future radios which can operate in the 3Ghz area, with 24 watts EIRP, to punch through vegetation and trees in remote areas from 1 to 10 miles from field research stations where Universities and public agencies place environmental and biological sciences Data Loggers, I endorse the NPRM as written.

For the past 8 years we have, under NSF grants to 'explore the uses of wireless in field science' deployed unlicensed radios to attempt to bridge the distance between field stations, and the places data loggers are deployed, gathering, over long terms (1 to 5 years) environmental and biological data. Until recently all such data loggers had to be tended manually, with repeated visits by those attempting to collect data. Only with the advent of unlicensed wireless has it been possible to set up networks, connecting such data loggers back, not only to field stations, but through it, to the Internet, so Research Scientists around the world can 'collect' the data and monitor their experiments real time.

The problems are rarely bandwidth issues. It is common to need only 9.6k bandwidth for data, or 384kbps bandwidth for video from CAMs. But invariably these data collecting stations have to be in wooded, or vegetation covered areas. Reach such loggers through trees and vegetation wirelessly is the major problem.

Providing radios which can operate with 44dBm of EIRP can help 'punch through' trees and vegetation which current limit radios to very short distances. At the same time the potential to create 'interference' of other radios is absolutely minimal. Never, in 6 years of deploying radios in central Alaska, Puerto Rico, Wisconsin, or Chesapeake Bay has there been a complaint about interference. We are talking about REMOTE science, whose data gathering findings are some of the only ways we will know how healthy or sick is our natural environment, assaulted as it is by all manner of human activities.

While the last thing the FCC would think about as a 'wireless constituency' are the tens of thousands of University field researches working in remote areas from off shore islands, to lake country in norther climes, forests of the West, and rain forests. Unlicensed wireless can aid in this work immeasurably if the FCC rules permit manufacturers to build radios that can use such radios.

Fifty six experiments are online at http://wireless.oldcolo.com which can illustrate both the experience, and needs for Environmental and Biological Science. (which itself is funded in the hundred's of millions of dollars by the NSF)

There is even a greater need than this NPRM provides for, for power at much lower frequencies to penetrate trees, however this proposal can go a long way toward solving problems now, while also permitting longer range 'backbone' links from the field, than lower frequency radios will permit.

Approve this NPRM as written.

David R Hughes
Principal Investigator
National Science Foundation Wireless Field Science Projects 1995-2003